

**Plenary Talk**

PV IV Tue 9:00 AudiMax

**Basics of plasma technologies: examples for applications and diagnostics** — ●HOLGER KERSTEN — Kiel University, IEAP, 24098 Kiel

Gas discharges involving surface phenomena have been studied for more than 250 years (1). Classification of discharge modes was initially based on their visual appearance and later by their current-voltage characteristics. Oscillating or pulsing of power supplied, involvement of magnetic fields, effects of electrode material and geometry etc. make the situation more complicated (2). Effects like secondary electron emission, thermionic emission, drifts in magnetic fields, gas heating, flow pattern and collision processes affect the discharge mechanisms

which are important for various plasma-based applications in thin film deposition or plasma etching as well as in plasma fusion or electric space propulsion.

In order to optimize the related processes suitable diagnostics for the plasma bulk as well as for the sheath in front of solid surfaces are necessary. Among them, methods for flux measurement of charged and neutral species toward plasma-facing surfaces by probes are of special interest. In addition to well-established conventional probe diagnostics also the principles of non-conventional diagnostics as calorimetric probes (CPs) and force probes (FPs) will be discussed (3).

(1) J. Cipo, H. Kersten, ViP 30(2018), 34-42.

(2) A. Anders, Appl. Phys. Rev. 11(2024), 031310.

(3) J. Benedikt, H. Kersten, A. Piel, PSST 30(2021), 033001.